Iconicity as Recognizability

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INTRODUCTION

Interest in iconic communication has been constantly increasing over these past decades. Not only as a point of theoretical interest in the field of semiotics, but as an efficient and simple way of communicating general information in everyday life.

In public places like airports, icons indicate directions or services. In printed form, like on product packages or instruction manuals, they provide detailed instructions in a synthetic way. On the internet "web sites", they guide users of many different countries, who sometimes do not even share a writing system.

This rediscovering of the power of visual communication is not completely new[1], but it has gained importance in the course of the century. In the middle of the 20s, the Austrian philosopher Otto Neurath began to promote the idea of instructing the masses by means of visual signs. His motto "*Worte trennen, Bilder verbinden*" (words divide, pictures unite) led him to propose the project of an international picture language named ISOTYPE (International System Of TYpographic Picture Education)[2], which would become a sort of visual Esperanto. A follower of Neurath, Charles K. Bliss, proposed a more comprehensive (but less iconic) sign system in 1967 (*Semantography*—actually in use, in a slightly derived form, for communication with speech-disabled people), and a similar attempt (*LoCoS*) was made by the graphic designer Yukio Ota in 1973 (Interestingly, the two were inspired, at least in the principle, by Chinese ideograms: it has been noticed for example that these allow a certain degree of mutual intelligibility of Chinese and Japanese written texts, although the language is not the same). Now these ambitious attempts to create complete visual languages of universal diffusion have left place to very successful applications of iconic communication in more practical domains: public information, technical reference, man-machine interaction.

In order to better understand this relatively modern phenomenon, let us have a brief look over the recent context which has made it possible.

The Comeback of Icons

Let us first point out that icon, as a means of communication, is not an invention of our time; on the contrary, during long periods in history, it has been a privileged way to give information to a general public—which was much often illiterate[3]. In the course of West European Middle-Ages, to mention but one of the best studied examples, at a time when religion was the most common cultural grounding, but when the language of the Church (latin) had become unintelligible to the masses, frescoes and stained-glass were used to "tell stories" from the Bible

in a visual way. Even the newly invented printing press was used to that purpose, in what was called "emblem books": in 1511, for example, the German artist Albrecht Dürer released a *kleine Passion* which was composed only of woodcut prints. Until the last century, also, the activities of shops and workshops were often indicated by three-dimensional signs, like a boot for a shoemaker, a key for a locksmith, etc. (Dreyfuss, 1972: 38)

What gives us the impression that our time discovers the icon, when in fact it just rediscovers it, is that for a couple of centuries, written, alphabetic inscriptions had been able to stand out as a general way to convey messages, thanks to the growing literacy. We were then living in what McLuhan (1962) called the Gutenberg era.

Of course written messages can, in many ways, say more than icons or symbols; and in the absence of any standard, it may seem easier to write "no dumping" than to try to represent this message graphically. Yet the general understanding of written messages is only possible when the language used is agreed upon, and that means in a historical frame where three conditions are met: a unified language exists on a given territory (like at a national scale), most people are literate enough to understand this common language in its written form, and the movements of persons or information across boundaries are still scarce.

What had led to the development of writing was a change in the second condition; what leads, now, to a comeback of icons, is a change in the third condition. Many people move their houses and workplaces many times during their lives. Tourists and businessmen travel all around the world. Immigration flows have been increasing at an accelerated pace for four decades. Goods are bought and sold everywhere. And information travels instantaneously on television networks and on the internet. Icons are, so to say, an ultimate consequence of globalization.

What Makes an Icon Efficient

In this globalized context, the most important concern for people who design icons is to ensure that they will be understood by the greatest possible number among the addressed people.

Therefore, the institutions who want to promote the use of iconic signs on a rational basis are now making efforts to define design methodologies and efficiency measurements. A very complete, and richly illustrated, panorama of the field of pictogram design has been given by Ota (1987)[4].

Today, professionals involved in the development and evaluation of new visual languages—graphic designers, semioticians and ergonoms—need a clear theoretical background to be able to understand why an icon will be efficiently recognized, by whom, and in which circumstances. They cannot only rely on intuition or obviousness to determine how reliably an icon will evoke an object or idea: they need both theoretical evidence, and experimental feedback.

In this paper, we are trying to think again about the main issues related to iconicity, in a pragmatic viewpoint; namely: how should the old methodological objects and theories be considered, when the main issue about iconic signs is their **recognizability**. This viewpoint quite admittedly restricts the object to an utilitarian perspective, and our experience lies mainly in the conception of information pictograms. We do not claim that these views may undistinctively be extended to other iconic signs in the broad sense (paintings, photographs, cinema). Yet we think it is useful to keep this self-admitted limitation in mind when thinking about a particular iconic *genre*: it will help us avoid the pitfalls of overgeneralizations and useless theoretical postulates.

So, we will try to give a concise and practical account of the three main theoretical issues concerning icons: how much has an icon to be "like" the object it aims at representing? (Section 1), how far can—and should—an icon be free of cultural influences, to be understood

by the most different people? (Section 2), and how much can icons be combined, internally or together, to form meanings? (Section 3).

We will then explain how, keeping these facts in mind, the design of icons for communication purposes may be guided to ensure maximal recognizability among a limited population (Section 4).

1. The question of realism

What makes the icon so useful for communicating across the barriers of languages? It is the fact that the icon *resembles* its object. To understand a written word, one must know some given codes: first, the language used, and second, the writing system. To understand an icon, on the contrary, one would hopefully simply need to having already seen the object it represents—and thus be able to recognize its shape.

So everybody would more or less agree to this fundamental property of icons: their resemblance to their objects. Yet there is much more to it than this simple resemblance. In fact, trying to ground a definition of the icon on this sole property, like Morris (1946) did, leads to an untenable theory: an icon is "all the more" iconic as it is essentially closer to its object. Morris wrote: "An iconic sign […] is any sign which is similar in some respects to what it denotes. Iconicity is thus a matter of degree." This point of view denies the icon the status of a semiotic object and makes it nothing but a more or less imperfect imitation of reality. It leads to what we could call the Cratylus paradox, after Plato's dialog[5].

On the contrary, the iconic sign, in functional uses, does not aim primarily at resembling its object as perfectly as possible. It aims at being recognized as quickly as possible by as many people as possible. And for this purpose, resemblance is an instrument, not a goal *per se*. It must in particular not be exaggerated: an efficient icon must be identifiable, but it must not display more details than necessary for that; otherwise it would take more time and attention to be perceived.

Anyhow the most important question for an icon designer is actually: what should the icon try to reproduce? Is it really an object of the real world, like the first intuition suggests? Then if I want to transmit the meaning 'house', which house in particular should I use as a model? It is in fact not so easy to cut a well individualized object out of the real world continuum, and to make it embody a general concept.

What the iconic sign really reproduces is an iconic *type*, i.e. a simplified and generalized visual representation of a concept, which may always be recognized through its different tokens. The type is, like the Groupe μ (1992) put it, an "internalized and stabilized model"[6], a form which has been built on the basis of visual perception. It is not a fully featured miniature of an object of the real world, it is a familiar shape. Figure 1 displays examples of such iconic types for *man*, *car* or *house*.

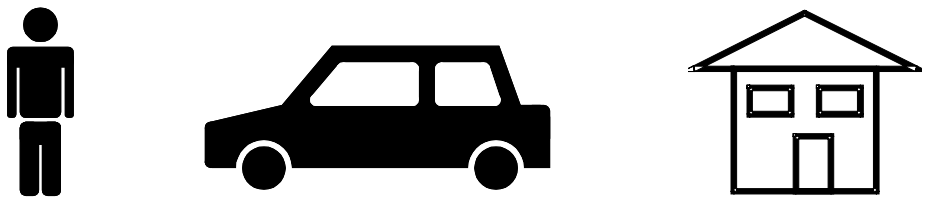


Figure 1: Basic iconic types

In cognitive psychology, these last decades, studies on categories have given evidence that the mind distinguishes a *basic level* which is, in folk taxonomy, the natural level of categorization (e.g. "dog", as opposed to "animal" [abstract], and to "retriever" [specialized]). This basic level

is, according to Lakoff's (1987: 46) summary: "the highest level at which category members have similarly perceived overall shapes; the highest level at which a single mental image can reflect the entire category; […] the level at which subjects are fastest at identifying category members […]". Moreover, in many categories, as Rosch's experiments show, some elements are judged to be more representative than others (e.g. robins are more representative of birds than ostriches or penguins): this is known as the *prototype effect*. These results give evidence about the cognitive status of iconic types. If we start from the notion that the "best" icons are those which are most easily recognized, then they also have to correspond to the visual aspect of these prototypical objects. Thus, the iconic type of 'man' does not portray a specially thin nor a specially large man; the 'car' is neither a racer nor a jeep; the 'house' is a typical square, two-storeyed house.

Similarly, the iconic type implicitly comes with canonical elements such as a canonical position and perspective. For example, a snake is always represented sideways; a man, standing up with parallel legs, in front view; a horse, standing, in profile (Figure 2.a). Other positions look unusual and seem to connotate something more than the bare concept (Figure 2.b).

The middle icon in figure 2.a, for example, used alone, labels the generic concept "man", whereas the middle icon in figure 2.b would inevitably suggest a "man, running" (actually, an icon very similar to this one is used, on road traffic signs in France, to indicate a relaxation area[7]). Only in a paradigm where it clearly stands in opposition to the shape of a man in motion, like in the pedestrian traffic lights at European crossroads, can the shape in figure 2.a come to mean something more than 'man' (in the example: 'don't cross the road').

Likewise, the right icon in figure 2.a is generally simply understood as "a horse", not as "a horse, standing, in profile", since this position is assumed to be canonical[8]; on the contrary, the right icon in figure 2.b suggests "a dead horse".

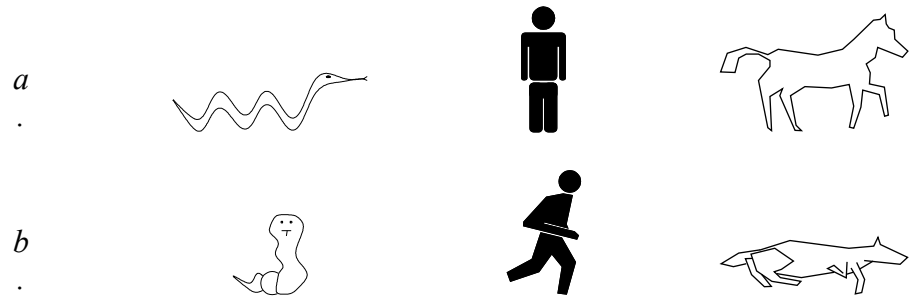


FIGURE 2: CANONICAL POSITIONS IN ICONIC TYPES

Similarly, the iconic type is generally given with canonical relevant details. It is, for example, much more important to the recognition of the simple shape of a human face, to provide *eyes* than to provide *ears* (Figure 3).

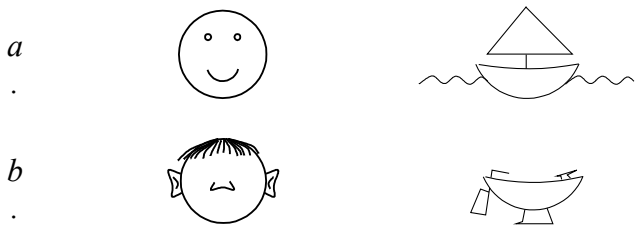


FIGURE 3: CANONICAL RELEVANT DETAILS IN ICONIC TYPES

This canonicity of certain iconic types can be easily displayed by submitting the drawings in figures 2 and 3 to children for a recognition test. The 'a' series prompts the simple answers "snake", "man", "horse", "face" and "boat", when the 'b' series prompts more complicated explanations, like "face with big ears and no eyes", provided the basic concept is still recognized.

Does the notion of type imply that the creation of a visual icon is nothing more than the copying of an already existing model? Not at all. A distinction must here be made between the act of reproducing an already existing visual model, and the act of founding a new model for an existing concept. These two distinct situations fall in the frames of what Eco (1975: § 3.4.9) calls *ratio facilis* and *ratio difficilis*. Eco (*ibid.*, § 3.6.7) distinguishes what he calls an expressive type (*tipo espressivo*) and a semantic model (*modello semantico*, which is actually what we call, following [Groupe μ, 1992], the iconic type).

Producing a sign within a *ratio facilis* means creating a new token of a sign that has already been invented—for which the content/expression convention is already established. It is then the type on the expression side of the sign—the *expressive type*— which is reproduced. This is what we do when we use a letter in the latin alphabet, when we write a Chinese ideogram, but also when we take an already standardized iconic sign and simply make a new copy of it. This situation is of course of less interest to us, since the question of recognizability has, at this stage, already been solved. A sign produced in *ratio facilis* to an existing expressive type can obviously still be viewed as iconic, as long as it is still identified as such by its readers; but this feature has become so to say contingent, since the convention is already established. In this connection, it is very interesting to notice that some ideographic systems have partially evolved from pictographic origins. This is the case for Chinese ideograms, Sumerian cuneiform ideograms or ancient Egyptian writings. It could even be at the deepest origin of our modern alphabetic writings[9].

Producing a sign within a *ratio difficilis* is inventing a new representation for an existing concept. This is what a graphic designer does when he makes a new drawing to represent a concept. In this situation, the person involved in producing the sign is really concerned in its being recognizable by any reader in the absence of a precise convention. This is when the *iconic type* is referred to. The iconic type does not consist in a fully specified model of the sign, which only needs to be instantiated (like the expressive type does): it is a visual abstraction, condensing the way we usually represent ourselves a given concept, with its most salient features and its most habitual perspective. It is a *semiotic mediation between raw perception and the concepts*.

If we make a correct interpretation of this conception, we are able to avoid two opposite pitfalls which semiotics has encountered in trying to define the very essential nature of iconicity: "the aporia of a simple theory of resemblance, and the implausibility and rigidity of a pure conventionalism" (Blanke, 1999). On the one side, the Cratylus paradox; on the other, the negation of any relation between the icon and the natural world, denounced as an illusion (this dogmatic conventionalism is expressed e.g. in (Greimas & Courtés, 1979). We can reasonably put aside the endless debates dragged by referentialist semantic theories, in assuming that iconic signs, like verbal signs in the Saussurean tradition, are linked to psychical objects, not to objects of the real world; and we can reject the objection that this leads to pure conventionalism, by acknowledging that this psychical object is originally rooted in visual perception—this is developed in more detail in (Vaillant, 1999: § 3.4).

The notion of iconic type thus allows us to view the iconic sign in a structural semiotic perspective, as the union of a *signifiant*—the actual image—and of a *signifié*—the iconic type. As soon as this perspective is adopted, theoretical questions concerning the ontological status of the sign, of its *denotatum*, and of its *realism* (considered as the nature of the relation to its *denotatum*), lose their importance. We take as given the ontological status of what we are trying to interpret or to produce: it is a sign, clearly identified as such. We take as granted that this sign has a *signifié* which is not an object of a real world but a cultural representation (i.e. a shared conceptual object): the iconic type. Hence, the question which is now of interest in this perspective is how to determine most accurately this cultural representation.

2. The question of culturality

It is at the level of cultural semiotics that the problem of iconicity can now be formulated. The iconic type being a cultural representation, to which the iconic representation is conventionally linked, any difference of cultural context can entail differences in the representation. Moreover, when icon is beginning to be used as a language, it has to invent codes to be able to express something more than what it can flatly represent; and these codes are strongly related to their cultural environment.

2.1. Cultural determinism in iconic types

The first level at which cultural determinism can be observed is the identification of the concepts itself. Choosing to express a certain concept by mean of a sign, whatever the nature of this sign, involves having already delimited a certain amount of cognitive experience and identified it as a concept (a "thought-sign"). Cassirer (1923: Introduction, II) shows how crucial the development of language is for giving consciousness this ability to abstract concepts from ever changing experience; this ability is in his view at the basis of abstract thought itself. Arnheim (1969: XIII) argues that language basically provides the categories that form the significant units in iconic signs. He also tempers the theory of language's overdetermining conceptual thought by recalling that some categories may also find their roots in visual or motor experience. The influence of language on the segmentation of our experience is still a mighty cultural bias, since language in return affects the way we interact with the world (Whorf, 1962).

A case of cultural variability could lie exactly there, in the levels which given cultures "choose" as being basic: "Berlin suggests that a given culture may underutilize certain human capacities used in basic-level categorization, for example, the capacity for gestalt perception. Thus, in urban cultures, people may treat the category *tree* as basic level." (Lakoff, 1987). The iconic type reflects this cognitive shaping of categories: it is formed at the basic level of categorization.

The canonical perspective (figure 2) implicitly present in the iconic type is another example of cultural element; it is not, though, very representative of cultural determinism since it is mainly determined by questions of visibility and recognizability of the shape. If a bicycle, for example, or a sombrero, are always represented sideways, it is because they are difficult to picture in other perspectives (or it is done so on purpose, like in the "droodle" figure 4, to puzzle the reader and create a pictorial riddle). There is however some evidence that the cultural context may influence this canonical position, even when no clear difference in recognizability is at stake. The ancient Egyptians, for example, in their hieroglyphs and in their two-dimensional frescoes, would practically never represent a human being or an animal in frontal position.

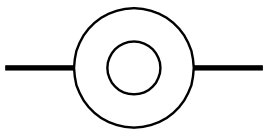


Figure 4: Droodle: cyclist with a large sombrero

A more obvious *locus* where cultural environment plays a prominent role, is in the canonical relevant details adopted implicitly in an iconic type to ensure identification of a concept. The judgement of typicality which is made on certain features depends on the natural and cultural *Umwelt*[10]. A good example of this phenomenon is for example the two pictograms representing 'man' and 'woman' for international public information signals[11] (figure 5). They can be distinguished by the shape of the silhouette, not based on morphological differences, but on

traditional clothes: the man is apparently wearing trousers, the woman a skirt. No other difference appear. This graphical opposition is of course entirely based on a culture where a clothing code clearly stipulates trousers for men and skirts for women. In this, it is already lagging a couple of decades behind our present cultural habits. What about its relevance for a society where this opposition does not exist? Let us compare with prehistoric rock paintings, where the representations of men and women would differ by salient anatomic details; or with ancient Egyptian paintings, where the distinction would mainly lay along the line: skirt (bare chest) for men vs. dress (covered chest) for women; or again with traditional Chinese painting, where both men and women wear ample gowns, but are mainly distinguished by the beard and hairstyle.

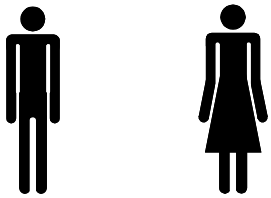


FIGURE 5: STANDARD ICONS FOR MAN AND WOMAN

In the same way, typical French people will tend to represent the concept "bread" in the form of a long loaf (*baguettes* being the most common presentation of bread in France), while the German will more likely picture it round. Many other such examples can be found, illustrating the fact that the way a given society impregnates and transforms its environment influences the iconic types it produces.

2.2. Other transcription conventions

We can then identify levels of cultural conventions which are not so directly linked to the processing of perception anymore. They arise when it comes to represent, in an iconic sign system, phenomena which are not mappable to a two-dimensional spatial expression of relatively simple and distinct shapes. They form a set of "transcription codes" (Eco1968: § B.1) by which some inevitable arbitrariness comes mix into figurative representation.

Icons, and more generally fixed images, are in fact very efficient to express two-dimensional visual scenes, as long as they can represent spatial relations (on the plane of contents) by other spatial relations (on the plane of expression). As soon as they have to represent something which is not homogeneous to two-dimensional spatial relations, or which does not fit the technical constraints of the medium, they have to invent codes.

It is already so, for example, when it comes to represent a third dimension of space. There is no unique, "natural" way to represent depth or thickness in images. There are various possible techniques or conventions, called *perspectives*, generally based on the attempt to reproduce one of the factors by which the human eye perceives depth (today, mainly: superposed planes, relative size, projected angles, shades; stereoscopic vision is still unpractical to implement). But modern perspective is not such an obvious, "natural" mode of representation, since it has only been invented in the Fifteenth Century, amidst the momentous cultural upheaval of the Italian *Quattrocento* (Panofsky, 1991). It is, admittedly, *naturalistic* but this naturalism itself is a cultural convention, not the necessary tendency of any attempt at pictural representation[12].

Many other visual phenomena, too, have sometimes to be expressed on a medium which does not have the possibility to express them by a simple projection. *Light*, for example, does not exist on a paper or street sign[13], these being lit uniformly by ambient light. In painting, it can be represented by a variation of color brightness. But in a line drawing, a very common usage consists in representing light as radiating from its source through convergent strokes (figure 6.a.

A discussion about this representation of a "folk" scientific abstraction can be found in [Eco, 1968: § B.1.II.6]).

Particular *textures* are also conventionally represented by graphical "tricks". Complex textures which can not be represented in their whole details, e.g. a tree's foliage (figure 6.b), the surface of the sea, the rough skin of a rhinoceros, a grassy meadow… are often represented by a few curves sprinkled about the figure, designed to evoke the fractal complexity of the object.

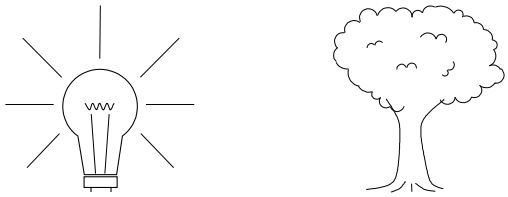


FIGURE 6: EXAMPLES OF TRANSCRIPTION CONVENTIONS

2.3. The level of symbols

Likewise, any attempt to represent an *action*, i.e. temporal depth, comes up against a fundamental contradiction with the statical nature of the icon. Lessing (1766) arguments that when art tries to express nature, poetry is in a better position to express actions, and painting in a better position to express bodies and their visible properties; hence that when painting wants to suggest actions, it has to do so indirectly, by representing intermediate stages around which our mind will be able to rebuild the whole action[14].

Iconic signs designers, in point of fact, have to face a choice when they have to represent anything which involves temporal development: either making use of several representations of the same referent at different moments, or suggesting the actual action by one of its most illustrative stages. The first choice is not always possible to implement; it must be recognized as such (which is not always the case, as witness the reluctance that young children sometimes have at identifying a same character in two figures of the same comics page); and it also involves some arbitrary conventions (should the successive figures be visually separated, e.g. by squares or lines? in which direction should time progression go?) On the whole, the representation of different moments of action, by breaking the implicit postulate of image's unicity, tends to add confusion for the interpreter of the image.

The second choice seems to be cleaner. However it raises a series of even more difficult problems. Even in the case of visually identifiable actions, it is difficult to choose the adequate phase to represent a whole process. Things get worse as one tries to represent more abstract concepts. If "raising hands" can be quite evidently drawn on paper, the problem gets more complex with "praying" or "surrendering" or "giving up".

At this point, we may say that the real, intended *signifié*, has become distinct from the concept providing the iconic type. The visually recognizable representation now only points to the actual *signifié* through a metaphorical transposition.

This process is actually not only used for actions, but for all other occasions to represent non-visual concepts. In all of these cases, the scene which is directly represented serves only as an indication to reconstitute the non-visual meaning. Here the iconic sign systems do not do anything else than verbal language when it uses lexemes with a visual content to express abstract meanings (*to run into*, *to lay down*, etc.): there is still an iconic relation between the representation and the iconic type, or "first-degree" *signifié*, but from then on, the way the abstract *signifié* is evoked rests entirely on the plane of contents: it connects homogeneous entities together (visual contents and abstract contents; see figure 7). In Hjelmslevian

terminology, we are here on the level of symbols, not on the level of signs (Hjelmslev, 1969: ch. 21).

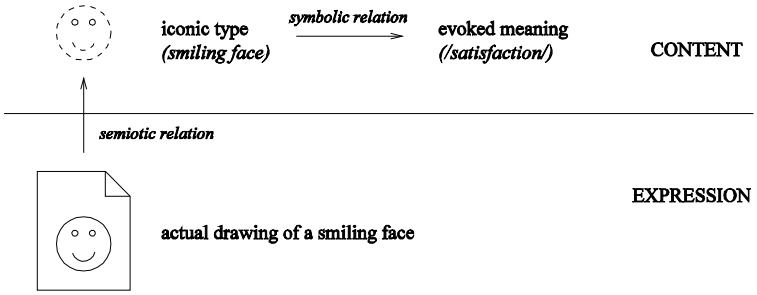


FIGURE 7: SYMBOLIC TRANSPOSITION OF THE ICONIC *SIGNIFIÉ*

Of course, it is on this level, that is to say beyond the icon, that cultural context exerts the strongest influence. The ways a graphical representation can resemble an iconic type are various, but still somehow constrained—at least technically—; whereas the ways a concrete concept may be used to symbolize an abstract concept are *a priori* not limited.

Commonly mentioned symbolic relation types are metonymy or metaphor (these terms borrowed to the vocabulary of rhetoric). In metonymy, the symbolic relation is grounded on an existential connection, for example when a typical tool is used to represent an activity (a trowel for masonry, a pick for mining); in metaphor, it is grounded on a transposition on a different semantic domain (e.g. an eagle used to represent the king because it flies high over other animals)[15].

These types of abstract relationships are obviously highly dependant on the historical and technical background of a society. Iconic languages, in this respect, share the cultural background which applies also to verbal language and other intellectual productions of any given human society: a web of common metaphors, of shared prejudices (*topoi*), of mental schemes (like the *scripts* and *plans* used in articicial intelligence), which form a sort of vast poly-semiotic intertextuality[16]. Any new cultural production is interpreted within the filtering patterns passed on by pre-existing cultural objects. Examples of clearly divergent symbolizations can be found, e.g. the snake being used to represent treachery (the image comes from the Bible [Genesis 3, 1–7]), when in other cultures snakes are symbols of divine power (like the *Quetzalcoatl* in Aztec cosmogony; or also in ancient Greece, where snakes are often signs or instruments of the Gods' wills).

FIGURE 8: INTERNATIONAL ROAD TRAFFIC SYMBOL FOR *DANGER*

Even for very common signs, used in everyday life, the relative abstractness of certain concepts has led to the development of graphical symbols which are not pictograms, but instead are based on some sort of symbolization. When these symbols are very widespread, like the symbol for *danger* in highway code (figure 8), the original symbolic link is not consciously evoked anymore every time the symbol is perceived. Instead, they function like mere *signals*, like Frutiger (1978) calls them, i.e. they are nearly reduced to bare stimuli. Then the original symbolic relation may well have led to different signals in different countries. If we consider for example the signs which are most commonly used for *chemist's shop* and for *post office* respectively in France and in Germany, we can notice that they have nothing in common: the

first is represented, in France, by a green cross (figure 9.a, left), and in Germany, by a Gothic A letter (standing for *Apotheke*, figure 9.b, left); the second is represented, in France, by a stylized bird (figure 9.a, right), and in Germany, by a hunting horn (a sign also widespread in Eastern Europe: figure 9.b, right). Moreover, neither of these has anything in common with more "international" attempts to represent the concepts as pictograms (generally based on the drawing of a phial for the chemist's shop, and on the drawing of a letter or postcard for the post office). Yet these four nearly arbitrary symbols perform better than any others at recognition tests; and even if they are sometimes completed by more international symbols, like the caduceus, in their biggest models, they are still mostly used alone in their respective countries.

a. in France

b. in Germany

FIGURE 9: GRAPHICAL SYMBOLS USED FOR "CHEMIST'S SHOP" AND FOR "POST OFFICE"

If even on practical examples, we face so much difficulty in getting hold of a simple, universal graphical representation, it is all the more difficult when it comes to represent abstract concepts or actions. It becomes clear that this problem is the big stumbling block of pictogram design, since on this point, graphic designers are left with their intuition alone. This may also possibly explain why attempts to define comprehensive universal iconic languages (like the above-mentioned *Semantography* or *LoCoS*) fail to meet a wider acceptance: however they try, they cannot create really universal symbols for abstract concepts, especially for verbs.

2.4. Temporal or spatial shift

Lastly, it should be kept in mind, when trying to distinguish between the practical notions of resemblance and recognizability, that icons, like any cultural objects, are emitted in a certain society, at a certain historical moment, and that changes of this extended context may lead to some loss of understandability of some of their features.

The relevance of a criterion of historical adequacy is challenged when for instance, Dürer represents the Roman soldiers guarding the Holy Cross dressed like the Middle-Age soldiers he was used to see in XVIth century Europe. Yet it may have been, in Dürer's time, the shortest way to convey the interpretation /soldier/, to the "visual" readers his paintings were designed for.

In the other way round, when icons, on information signs, picture the concept "telephone" with an old swivel dial; or when traffic signs use the drawing of an old steam-powered train for level crossings; the question is no more that of representing objects of the past with contemporary visual referents, but that of representing contemporary objects with old visual referents.

It seems that in many cases, a visual type which factually is no more accurate vis-à-vis its present referent, is used because it leads to a better recognizability than a modernized representation would.

Does this challenge the iconicity of such signs? Not really, since the type actually still bears a link with a world of visual perceptions belonging to the iconic semiotic field (paintings and drawings of old trains, old films where private detectives use old telephone dials...) This simply shows that visual types that have emerged in precise historical contexts (in our examples, in the first decades after the spreading of telephones and trains in everyday life), have managed to stand

out as pregnant identifiers, which now actually "work" better at signifying their referent than a more up-to-date representation.

By anchoring visual signs in diachronicity, this fact indirectly witnesses the very semiotic nature of those signs. They are subject to the fundamental laws of sign systems, and this includes a temporal "lifetime".

In (Vaillant, 1999: § I.9) we proposed a model for the evolution of visual signs, where four stages can be roughly isolated from a temporal continuum: (1) a code setting stage, where pictural representations still try to more or less accurately represent the physical objects; (2) a code freezing stage, where the canonical representation sets down to become a fixed model; (3) a contemporary stage, where the code is already fixed (*ratio facilis* paradigm), but the representation is still "felt" (by its readers) to be iconical; (4) a final phase, where the feeling of iconicity has been lost, due to the combined evolutions of the signifiant and of the signifié: this is e.g. the case with Chinese characters which were originally pictograms, but which now function as mere writing signs.

Distance in space may somehow affect the interpretation of a sign in the same way as distance in time does. This was particularly true at a time when there was not so much communication between countries and cultures as there is now. Today it is not uncommon to see signs which have an iconic origin in one part of the world spread out in other places, where they are irrelevant to the local equivalents of the original referent. This holds as well for the "trousers/dress" opposition seen in fig. 5—where the model is a fossilized stereotype of the western civilization—, as for lots of icons designed for computer systems, where the referent is clearly and more specifically North-American.

FIGURE 10: END OF RESIDENTIAL AREA (PHOTO TAKEN IN JORDAN BY MFC)

At present we are in a paradoxical situation where the cultural types travel faster than their actual referents, like the photograph in figure 10 witnesses: it is a standard "end of residential area" sign, like many may be found in Western Europe, picturing children playing outside a traditional bricks house, near a pavement; but the photograph has been taken in the desert in Jordan, and the residential area actually was a tents village!

3. The question of articulation

3.1. Internal articulation in iconic signs

A visual sign always displays internal elements. It is actually the very presence and configuration of the internal elements which allow the sign to be recognized. As displayed in the examples on figure 3, some elements have a specific importance because they are "more" characteristic of the type; if they fail, the type fails to be recognized; if they are there, it is recognized.

Figure 11 shows an example of such internal elements. In figure 11.a, the very simple combination of elements is spontaneously interpreted as a human face. Figures 11.b, 11.c, and 11.d show that the internal components are not themselves characteristic of the type: the circle alone, or the smaller arc of circle alone, or the dots alone, are not enough to signify the visual signifié /face/. Only a precise spatial combination of all of them triggers this interpretation.

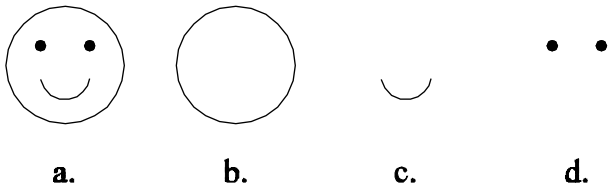


Figure 11: Internal elements to recognize the simplest visual type "face"

But there is more in visual signs than simply smaller elements whose function is to allow the sign to be recognized. This definition could also hold for the phonemes in spoken language, or for the graphemes in written language. In the English spoken word /fɛɪs/, for instance, it could also be said that not /f/ alone, nor /ɛɪ/ alone, nor /s/ alone, determines the meaning "face", but only the combination of those three elements (face ≠ fate ≠ bait ≠ bite, etc.), and in that specific order (face ≠ safe). However, in the examples from spoken language, those characteristic elements have no meaning by themselves, even when dipped in the context of a word. Instead, in the iconic sign, when the two dots of figure 11.d, the arc of circle in figure 11.c, and the circle in figure 11.b are put together in a certain order, they not only have a distinctive function but they also are visually interpreted as eyes, mouth, and face contour respectively.

In the iconic sign, there is a phenomenon of what Sonesson (1989: 299) calls "resemanticization". The dot, a tiny detail in itself, is resemanticized in the context of the configuration in figure 11.a to be interpreted as an eye.

This resemanticization is nothing different than a strong influence of the (global) context on the (local) element. It is widely acknowledged that this type of influence exists in every semiotic system, including natural languages. Even if a "compositional" conception of meaning has remained in the mainstream of linguistic theories, every linguist would agree that the word *rat*, for instance, has a different value in the context of a zoology book and in a gangsters movie—yet being exactly the same word, not a homophone. The position that this influence of the whole on the part has to have in a linguistic semantic theory is debated: some still think that the question concerns a set of peripherical facts. However, the comprehensiveness and consistency of the compositional theory of meaning generally is proven true within a fixed set of examples cautiously selected by the linguists—hence it seems a reasonable empirical caution to assume that unless proven otherwise, any context exerts some sort of influence on the meaning of any sign. This bidirectional theory of meaning, where texts give meaning to words as much as words give meaning to texts, fits with systemic thought, and is now defended by some

linguists (Rastier, 1987): it assumes that the interpretation of any text follows the principle of *hermeneutic circle*.

It is no wonder if this conception of the construction of meaning, going downwards as well as upwards, works even better in the visual world than in the linguistic world. Context has an even stronger influence in the case of iconic signs. Going back to the "face" example, if small crosses replace dots, at the same position in the spatial configuration, they are still interpreted as "eyes" (figure 12).

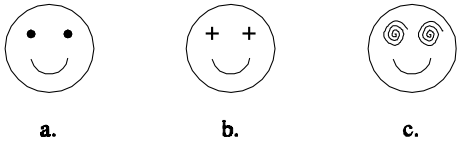


FIGURE 12: CROSSES AND SPIRALS RESEMANTICIZED INTO EYES

This type of phenomena has been studied in detail by the Gestalt psychologists, who explained them in terms of shape perception. To the question: "why do things look as they do?", Koffka (1935: 98) answers: "things look as they do because of the field organization to which the proximal stimulus distribution gives rise." In other words: what the human perception first sees is the overall shape of a face, and the interpretation of one element as a mouth, and of another element as an eye, comes afterwards, as a consequence.

So, the smaller elements in iconic signs have quite a different status in the visual semiotic system than the phonemes in the verbal semiotic system. If both can be said to contribute to the global meaning by defining a meaningful configuration, the visual elements charge themselves with part of the meaning (eyes, mouth, etc.), when the phonemes, on the contrary, stay below the semiotic threshold. The smaller elements in an iconic sign are signs themselves.

In orthodox structuralist terminology, if signs are decomposable into smaller signs, then they are not only signs, but *texts*. So the best parallel with verbal language could actually be found at the level of texts: an icon is a text, made up of smaller signifying elements, which are signs—just as a text in a human language is made up of words and morphemes.

This conception implies that the type of dependencies between parts of expression which may be found in visual signs stays at the level of languages's *first articulation* (decomposition of syntagms into signs), not at the level of its *second articulation* (decomposition of signs into figures). This obviously challenges the attempts to project the notion of double articulation, which had been developed for linguistic systems, on visual semiotics. The very notion of double articulation implies that there is a clear threshold where units of meaning cease being linked to units of expression; such a threshold will obviously not be found, at least not in a way that can be generalized, in visual semiotics.

Eco (1975: § 3.5.9) has given up his earlier attempts to decompose the visual semiotic systems into articulation levels, to state that the "so-called 'iconic signs' [should be regarded as] (a) VISIBLE TEXTS, which (b) are NOT FURTHER ANALYSABLE neither into signs nor into figures"—yet he admits the existence of smaller signifying units in those visual texts, so why not call them signs?

In previous works (Vaillant, 1999: ch. 3), we have proposed a model of double articulation specific to some visual sign systems, and argued that such a double articulation model could be found in any particular visual sign system (as long as it is not confused with a generic double articulation model for all visual signs), since any visual text could obviously be *physically* decomposed into elementary units of perception on the expression plane (colour stains, pixels, photograph grains, etc.) But we had assumed that any atomic unit of perception may be called a semiotic unit, which actually does not have much meaning when these units are below the threshold of perception as individual units—so we would now more simply say that there is no such thing as double articulation in visual signs, in general.

A more modest conception of iconic visual texts as systems is to view them as biplane semiotic systems, decomposable in signs, and where every unit at any level on the plane of expression still has a corresponding unit on the plane of contents.

In a doubly articulated semiotic system like language, the source of meaning is the second articulation: some elementary units under the meaning threshold (phonemes, graphemes) form certain combinations which allow some portions of the text to become "mnemonic keys" giving access to items in a lexicon—i.e. given primary sets of semantic units; when some elements are given, the whole text is then interpreted by a process of hermeneutic circle, eventually assigning a stable meaning to the whole and to every one of its part.

In a semiotic system like the iconic visual text, where only one homogeneous type of relation among parts exist at every level (one single articulation), the source of meaning must reside somewhere. It seems adequate to say that it resides in the *pregnant forms*, i.e. those basic visual configurations which have been learned by our visual perception system primary to any semioticization: regular geometric forms, very common forms in the world of experience (human faces, etc.) These forms are the *Gestalten* that Gestalt psychologists have shown to be at the basis of our field perception of visual stimuli.

In this conception of visual texts, some pregnant forms are perceived prior to any other higher-level configurations, or tinier details; and after meaning has been assigned to those forms, the whole image is interpreted in a process of hermeneutic circle, just like for linguistic texts (or even: much more than for linguistic texts), by putting these forms into context in broader configurations, in an upward perception movement; and by "resemanticizing" tinier details, in a downward movement.

This is our interpretation of what Eco (1998) calls the *Alpha and Beta modalities of semiosis*: the Alpha modality, in Eco's terms, corresponds to the perception of forms by the basic level of visual perception (without triggering the semiotic interpretation system), and the Beta modality corresponds to our faculty of semiotic interpretation.

3.2. Non-iconic relations inside iconic texts

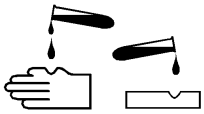
Having admitted that icons can be viewed as texts, of course it still seems somehow strange to compare a linguistic sequence such as "rounded face contour, eyes above, mouth below" to a small icon like the one in figure 11.a. But this is very simply explained by the facility with which visual texts are equipped to represent bidimensional spatial relations (on the plane of contents) by bidimensional spatial relations (on the plane of expression). However, when it comes to represent other types of semantic relations than spatial relations, icons may make use of the same type of devices as language does, like implicit knowledge, predication, or metaphor.

This may be seen in many examples, starting with the most common pictographic signs used on public information signs, on machine commands, or in software graphical user interfaces (GUI). The pictogram on figure 13, for example, does not say "this is a broken glass", it says: "danger: fragile object". There is an implicit causative in the message; the reader is invited to "reconstruct" the process leading to a broken glass, and to infer the indication of a type of risk. The sign in fig. 10, which we have used as an example before, does not mean "car, house, man, leaning boy, ball, red line", it means "not in a residential area [anymore]". Its interpretation supposes to understand the implications *leaning boy + ball → playing children*; then *house + strolling man + playing children → residential area*; then *residential area + red line → leaving a residential area*.

FIGURE 13: GRAPHICAL SYMBOL FOR "DANGER: FRAGILE OBJECT"

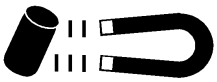
However, experiments have shown that such "assembled" pictograms, representing semantic relations of a type other than spatial, are not so easily understood by subjects as plain icons. Bordon's study (2003) for instance showed that pictograms like those presented in figure 14.a, figure 14.b, and figure 14.c, meaning "hand wash", "danger: corrosive" and "non-toxic plastic: suitable for food", respectively, were misinterpreted by a significant number of subjects (8/14, 2/14 and 14/14 respectively), in the absence of a very strong determination by the external context. And a pictogram like the one shown in figure 14.d, meaning "recyclable steel"—the interpretation of which calls to a great part of implicit knowledge (steel is magnetic, and steel is recyclable)—was nearly not understood altogether, even with a non-ambiguous context.

a. hand wash



b. danger: corrosive

c. non-toxic plastic: suitable for food



d. recyclable steel

FIGURE 14: SOME GRAPHICAL SYMBOLS IN BORDON'S STUDY

These experimental clues tend to confirm a conclusion that the theory of articulation in iconic texts presented above (Section 3.1) naturally implied: if the first movement of the semiosis of icons resides in the recognition of primitive forms, then any additional internal complexity will tend to add to the recognition time; and this all the more so when the internal complexity breaks with the spatiality of "genuine" icons to insert some other types of semantic relations between iconic elements.

3.3. Combination of pictograms

We have no reason to think that what holds below the level of the iconic sign does not hold above that level. To begin with, we do not even have a good reason to think that there is a clear level at which the iconic sign can be delimited and identified as such, since, as we have argued in Section 3.1, (a) there is no double articulation, in general, in iconic sign systems, and (b) iconic signs are indeed iconic texts.

In a fresco painting, for instance, there are many iconic signs at different levels (a table, a loaf of bread, an apostle, the hand of an apostle...), and yet the only clear level at which a limit can be drawn is the whole fresco itself.

Yet, if we talk about *pictograms* rather than about *iconic signs*, we are in a more specialized perspective, and there is a tradition, in the modern use of the word, to delimit pictograms by a clear outline.

If a frontier is drawn between a dimension which is internal to the figure, and a dimension which is external to the figure, then there is a possibility to delimit where the iconic interpretation should stop, and where another type of syntagmatic relations may begin. This is all the more feasible when the internal space and the external space[17] do not have the same topological properties. For instance, if the pictograms in a given sign system are monochrome drawings in two dimensions, and if the possible combinations of more than one of them are always arranged in a line, then the internal space is a bidimensional space, and the external space is a unidimensional one.

The Japanese school of pictographic design (Katzumie, Ota) has set up a distinction between 絵文字 (*Emoji*) and 絵ことば (*Ekotoba*), which goes along this line. The *Emoji* is an iconic visual sign, and the *Ekotoba* is an iconic visual syntagm (Ota, 1987: 20). An example is the disposition of two signs, one meaning "toilets", and the other "left direction", to form a message which should be interpreted "the toilets are on your left".

This type of distinction is of course interesting for those iconic sign systems which draw a distinction between an internal space and an external space, like e.g. the information pictograms, or comic strips. As soon as the frontier of the figure inhibits the iconic interpretation of spatial relations, a disposition of figures becomes a syntagm, which should be interpreted—however in a limited fashion, because of the absence of a fixed grammar—like the sentence of any linguistic natural language.

4. Towards a pragmatic validation methodology

From the theoretical evidence exposed above, we have learned to consider that icons are not a passive reflection of some idealized reality, but that they are cultural artifacts which have to be actively *designed* with a given purpose. In particular, when the purpose is to ensure maximal recognizability in a given usage context, we have shown that the ideal of "likeness" to the object is far less relevant than the possibility to identify a given schematic type.

To guide the icon designer in such contexts, it is useful to have a design methodology in mind. The basic principle underlying the whole methodology, as in any social inquiry, is to check the validity of the models against the reality of the concerned people.

A guidebook was written by the TC 145, the Technical Comittee of the International Organization for Standardization (ISO) responsible for standardization in the field of graphical symbols (ISO/TR 7239). Its purpose is to provide guidelines at every point of the development cycle of a new pictogram, from *before* the decision to use one (would it not be easier to build barriers around a dangerous site than to display a pictogram saying "danger"?), to the moment when the sign should be installed and validated.

The best complete source of information in this domain is that guidebook. It is designed to be used by big organizations with money to conduct surveys, and time to poll lots of participants; so it might not be practically implementable, in every aspect, by every graphic designer having to fulfill a private contract. However, the essential stages it advises to go through are useful at any scale, and they correspond to the pragmatic semiotic methodology we are interested in. They mainly consist in: (1) a bottom-up collecting process, allowing various unconstrained

propositions for iconically representing a given message to emerge; (2) a top-down selecting process, allowing a sample public to choose which of the propositions is best adapted; (3) a validation process, measuring the recognizability of the representation which has stood out at step (2), and verifying that it fits the optional security margin for minimal recognizability.

In the following lines, we will describe how these general principles have been implemented on smaller-scale experiments that have been conducted among 44 eighth-class and 28 ninth-class (in France: *classe de quatrième* and *classe de troisième*) school children in Mantes-la-Jolie (a Parisian suburb) in 1995 and 1996; and among 42 educated colleagues working in a CNRS research team (LIMSI) in 1995.

4.1. Bottom-up collecting process

The goal of the first stage of the experiment is to let every subject assign a likely representation, or a set of likely representations, to a given message among a set of messages. The set of messages is the contents part, somehow the *signifiés* of the icon system. They never form a complete semiotic system like a natural linguistic system, though, so their meanings contents is itself expressed by a paraphrase in natural language.

ISO/TR 7239 recommends to look for candidate pictograms among those which may already be in use, in a pre-standardized phase, in a given population, or to make a public competition announcement and to ask for professional graphic designers to tender their propositions. In our type of experiment, we simply ask the subjects to make a drawing which they think will adequately represent a given message. To make the results of this first stage more suitable to go through material reproducing constraints, it may be precised to the subjects that the drawing should be a black line drawing, making use of simple types of contours.

The work of the analyst, after having collected such an image corpus, is to be able to segment every drawing in small characteristic elements. This may require a part of subjective expertise (although the units are generally clear-cut enough in a line drawing). Then, a list of all occurring elements is made, and the most frequently recurring ones are identified.

At that stage, the table of co-occurring iconic elements is examined. For example, figure 15 displays a sample of twelve[18] drawings made by school children when asked to represent a fire engine. It appears that the ladder, the flashing light and the fire hose are fairly widespread distinctive elements in the iconic type of the fire engine.

If some of the elements tend to co-occur in similar configurations, they probably form an iconic syntagm and should appear together in one of the type variants submitted at step (2). If two elements, on the other hand, generally never co-occur but appear in turn at some position in a configuration, then they probably are part of a paradigm, i.e. they are two variants for a given unit in the iconic text. Paradigms may be identified at the most elementary level, as well as at the iconic syntagm level—up to the whole type itself. If there is a paradigm with more than one element, then there are more than one candidate type variants.

Talking about one single variant, the set of the most frequently occurring elements, and the configuration that they build, is a profile of the average iconic type that resides in the minds of the people of the given sample. We regard it, with all due methodological caution, as the expression of an object belonging to a social semiotic layer.

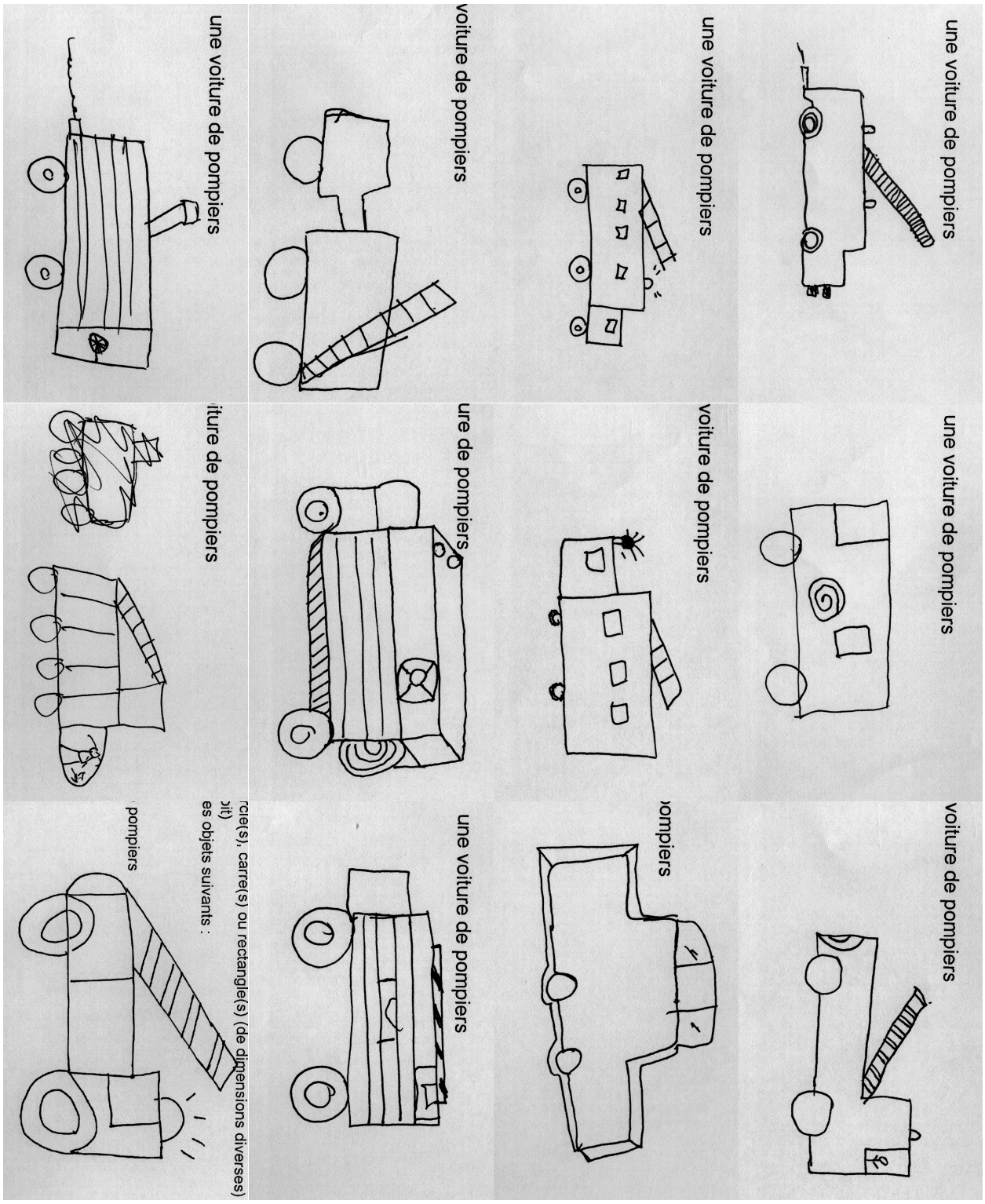


FIGURE 15: 12 FIRE ENGINES BY EIGHTH-CLASS PUPILS IN MANTES-LA-JOLIE

4.2. Top-down selecting process, and validation

The second step in the methodology consists in submitting candidate iconic types to a pool of subjects, and to ask them what is the message they perceive. If the number of answers that correspond to the expected answer is above a certain threshold, it can be assumed that the iconic type is *recognized*.

Again, there are no physical constants here but only empirical data and arbitrary decisions. In our study, we had decided that an icon would be validated if no more than three subjects (i.e. one fourteenth of the sample of 42 people: 7%) failed to provide the expected answer. But in certain security-sensitive contexts (for example, pictograms giving indications about safety measures when handling toxic products), the misunderstanding threshold may be set even lower (until 0%).

4.3. Locality

To ensure the best and quickest possible recognizability, the question of the targeted population has to be taken into account even before the level of icon design. As we have seen, culturality is inherent to any semiotic representation, even pictographic. It is therefore important to involve this parameter into the icon design process from the beginning on: when controlled, culturality biases might be regarded as positive data used to cast signs as relevant as possible.

In a survey of the type we describe, results from the selected population reveal nothing more than trends of that very same population. Like in linguistic surveys, where the rules abstracted from a corpus, ideally, describe nothing more than the corpus itself, generalization may be done only with much caution. So, a conclusion of such a study on a given population P should not be stated as "this visual sign is a good iconic representation of that message", but "this visual sign is confidently perceived as a representation of that message by the population P".

If the goal of the study is to define a graphical representation valid exactly for the population P, or for a broader population of which P may be assumed to be a representative sample, then there is nothing to change from the conclusion to the actual use. If, on the other hand, it is envisioned to extend the results of the study to quite a broader population, then it cannot be done by simply disregarding the local bias. Either a broader sample should be found: a new sample which would be representative of the broader population—or, if this is not feasible, the expert should try to identify what seems culturally biased in the results; and if she or he decides to modify something to compensate for that bias, state it explicitly and with a motivation, since this compensation is unavoidably subjective.

As an example, in the results of our study, it appeared that the most "successful" graphical representation for a post office in the samples (composed of French people or French residents) was the icon of a house with the "La Poste" logotype in it (see figure 9.a). If the goal had been to use the symbol among an exclusively French public, then this type should have been adopted without hesitation, since it had the best score. But in the present case, the goal is to use the symbol on public information booths meant to be used by tourists who may come from anywhere in the world. The expert here has to be aware that the "La Poste" logo is not a universal representation, and may propose something hopefully more useful for a general public (like a house with a small envelope in it). The resulting pictogram might be slightly less efficient for the French public, but it will be far more broadly recognizable.

Again, the important point here is to be empirical as much as possible, and, when it comes to take subjective decisions, to be conscious of their subjectivity.

CONCLUSION

Our view of iconicity is much more a practical perspective than a theory of the iconic sign; as we have written earlier (Bordon & Vaillant, 2001), for applied purposes, theories are good as far as they give a useful insight of the object; and in the real world, it is a better choice to be finicky with data and relaxed with theory than the other way round.

Yet it seems to us that taking this practical perspective as a starting point has allowed to develop useful conceptions of iconic sign systems, which may have an extended validity for the semiotics of graphical communication, and reconcile, in this field, different theoretical standpoints.

The essential conclusion of our work in the frame of the debate on iconicity would be that by (a) locating the primal source of visual texts semiosis in Gestalt perception, and (b) showing that the interpretation of articulated texts, after that primal movement, follows a principle of structuration in syntagms similar in its fundamentals to the one which governs the interpretation of written texts (despite the difference in semiotic dimension); we are actually remaining in the structuralist (non-referentialist) tradition, and at the same time we are giving a ground to the specificity of iconic signs.

As a matter of fact, Gestalt perception actually is common to the vision of reality and to the vision of iconic semiotic artifacts (which distinguishes them from the so-called arbitrary signs); but the semiotic artifacts are then subject to the general principles of human sign systems, and in our view this suppresses any temptation to see immanence in icons, and to get involved in questions concerning the status of the referent.

On the practical ground, this view of iconicity leads to giving an essential status to the notion of iconic type, which fundamentally is a social representation, like the saussurean linguistic *signifié*, instead of giving importance to the *referent*. This iconic type should then, in this view, be studied like a social object, by empirical surveys.

NOTES

1. Even if some graphic design firms' publicity give the impression that everything, from the principle of drawing itself, has been freshly discovered in 1994.
2. A collection of drawings made for ISOTYPE by the graphic designer Ger Arntz has been published in (Arntz, 1979). They have mostly been used for the presentation of statistical data. A history and explanation of Neurath's ideals and project can be found at (Hartmann, 1998).
3. The noble filiation of Egyptian hieroglyphs is one that many would be proud to claim; but hieroglyphs were made for a caste of initiates, which is precisely what modern icons do *not* want to be.
4. Complete technical specifications are of course to be found in documents published by the ISO (International Standards Organization) or its national members (ANSI, AFNOR, BSC, DIN, JIS...), like ISO/TR 7239. The relevant standards for pictograms are ISO 7000 and ISO 7001.
5. In *Cratylus*, Socrates demonstrates the absurdity of demanding that the sign should be like its object, through the following paradox: if some God created a representation of Cratylus which would possess all of Cratylus' properties, including warmth and softness, then would there be Cratylus and an image of Cratylus, or two Cratyluses? He concludes that "the image, if expressing in every point the entire reality, would no longer be an image".
6. "*Il s'agit d'un modèle intériorisé et stabilisé qui, confronté avec le produit de la perception, est à la base du processus cognitif.*" (Groupe μ, 1992: 137). It should be noted that the authors in the Groupe μ still postulate the existence of a referent, with a role distinct from the type: the referent being a particular object of the real world, used as a model for the icon. We do not consider this notion as being necessary, since the relation between the icon and the perceptual reality is already present, though indirectly, in the type (the type finds its origins in the visual perception, through an abstraction process) (Vaillant, 1999: ch. 1).
7. AFNOR NF P 98-542-1 Standard, 1995.
8. Eco (1968: § B.3.I.1) expresses the idea that "*anche la piú rozza silhouette di cavallo non corrisponde al solo segno verbale 'cavallo' ma a una serie di possibili sintagmi del tipo: 'cavallo in piedi di profilo' [...]*" (even the roughest silhouette of a horse does not correspond to the mere verbal sign 'horse', but to a series of possible phrases of the type: 'horse, standing, in profile' […]). We think that on the contrary, in a minimal context (the reader is trying to reach an immediate visual recognition, not to interpret a painting of David representing Emperor Napoleon's triumph), a silhouette of a 'horse, standing, in profile', evokes nothing more than a horse.
9. The early Phoenician alphabet, which has given birth to most of the important writing systems in use today (Arabic, Hebrew, Greek and its descendants: Latin and Cyrillic) may have originally consisted of drawings representing words used only for their first letters.
10. Eco (1968: § B.1.II.5) illustrates this by an interesting *Gedankenexperiment*: in an African community where the only known quadrupeds would be the zebra and the hyena, and where horses, asses and mules would be unknown, it would be more important, in the graphical representation of zebras, to insist on the shape of the muzzle and on the length of the legs, than to draw stripes. We are not totally convinced by Eco's unverified hypothesis, since it is likely that such a "naturally" salient feature as the black and white stripes would probably have to be part of an iconic type anyway (the cats' pointed ears are always present in drawings of cats, even if they are not particularly characteristic of the specy). The argument is however consistent and illustrates the logic of the feature selection process.
11. A model of which is given in the ISO 7001 Standard, 1990.
12. Not only about perspective, but in general, must "naturalistic" be distinguished from "natural". Naturalism can be a feature of some genres in given cultural contexts. It aims at reinforcing the

impression of presence to reality (what Greimas and Courtés [1979] call "*illusion référentielle*"). It can be applied to different kinds of arts, including non-visual, although in those it obviously has to use different paths. Even in prehistory have "abstract" representations often preceded "naturalistic" ones, like studies on religious art in the Paleolithic (Leroi-Gourhan, 1964) and Neolithic (Gimbutas, 1982) ages showed.

13. Unless it is rear lit, in which case light might become a metaphor of itself.
14. "*Alle Körper existieren nicht allein in dem Raume, sondern auch in der Zeit. Sie dauern fort, und können in jedem Augenblicke ihrer Dauer anders erscheinen, und in anderer Verbindung stehen. Jede dieser augenblicklichen Erscheinungen und Verbindungen ist die Wirkung einer vorhergehenden, und kann die Ursache einer folgenden, und sonach gleichsam das Zentrum einer Handlung sein. Folglich kann die Malerei auch Handlungen nachahmen, aber nur andeutungsweise durch Körper.*", (Lessing, 1766: § XVI). For some of the shrewd studies on posters collected in *L'image manipulée*, Fresnault-Deruelle (1983: § IV, V) is led to the same type of observations: "*D'une façon générale tout l'art des images uniques à vocation narrative consiste à distribuer lisiblement des indices rétrospectifs ou, au contraire, avant-coureurs d'une action posée comme un référent lacunaire à reconstituer […]*".
15. A far richer taxonomy of such types of figures is quoted in (Eco, 1993: ch. VII). It comes from a 16th century treaty, *Thesaurus artificiosæ memoriæ* from Cosma Rosselli, and lists the types of ways in which a thing can be used to represent another ("*quomodo multis modis, aliqua res alteri sit similis*").
16. The global conception of intertextuality primarily proposed by Barthes (1968) can in our view be extended to other semiotic systems.
17. The notions of internal and external space are developed in our glossary of semiotics, available (in French) at the address: `http://www.vaillant.nom.fr/pascal/glossaire.html`.
18. 12 among 44; there is no bias in the selection of these particular 12 drawings: they are the 12 first ones in the collection.

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